

COLUMN ASSEMBLY FOR DISPLAY FRAME

RELATED APPLICATIONS AND PRIORITY CLAIM

The present application is a continuation-in-part application of co-pending U.S. Patent Application No. 09/953,111 filed September 13, 2001, entitled, "BOX FRAME ASSEMBLY", hereby fully incorporated by reference herein in its entirety.

FIELD OF THE INVENTION

The present invention relates to displays, and in particular, to a column assembly for use in display exhibit configurations.

BACKGROUND OF THE INVENTION

In the construction of exhibit and display stands at trade shows, it is a conventional practice to utilize various truss and frame structures to assist in erecting and configuring the walls that create the backdrop for a particular vendor's defined booth space. Typically, column and truss structures are designed so that they are readily collapsible for transportation to and from trade shows.

With this collapsibility design preference comes requisite structural features. Intermediate webbing and other forms of cross membering often provide collapsible pivot points for erecting and collapsing the frames. In addition, webbing or bracing is often added in an attempt to offset any structural instability that may develop as a result of the collapsibility feature, thus providing additional stability along the length of the frame. Even those frames or trusses that are not designed to collapse or fold implement intermediate webbing to obtain increased stability. The intermediate webbing generally occupies the internal channel or space

defined by elongated cylindrical, tubular or rectangular principal frame segments, with the webbing generally extending the length of the column or truss intermittently fixed to these tubing segments.

U.S. Patent Nos. 5,351,843, 5,822,945, and 6,149,021 each define columns or trusses that are designed to be easily folded for portable display systems. Each of the patents discloses a column-like structure of elongated shape with various diagonal webbings. U.S. Patent Nos. 5,711,131 and 6,079,178 disclose elongated truss structures for use in display systems, where the column-like structures are not collapsibly portable. Instead, intermediate webbing is provided for stability, and in the case of the '178 patent, for easier stackability.

Intermediate webbing, such as those described above, are a result of conventional notions of what is required in order to increase stability for these column-like structures. Since these elongated structures are often necessarily narrow, webbing has been seen as a way of distributing the weight throughout the frame to prevent buckling while at the same time eliminating the need for a solid-bodied structure that would be difficult to transport, heavy, difficult to manipulate, and thus contrary to the multiple configuration requirements of portable display construction and design. Despite the popularity of these conventional intermediate webbing techniques, there are inherent drawbacks.

First, intermediate webbing increases the manufacturing and material costs of the frames. Second, webbing can be aesthetically unattractive. A cluttered and industrial-looking webbed frame structure diminishes the appearance of the overall display, and ultimately draws the human eye toward these complicated structures and away from what displays want a potential client to focus in on, namely the graphics and display materials. Third, webbing significantly limits the placement options for those appurtenances with attachment means that extend around the

principal frame segments. The intermediate webbing is connecting to the tubing segments at a plurality of connection points, there are portions of the tubing which are unavailable for removably securing various grasping attachments (i.e., clamps, clips, shrouds, etc.) since many attachment means require unobstructed surfaces in order to wrap around or clamp on to the tubing segments. In an attempt to combat this limitation, frames may be constructed with mounting slots machined into the outer surface of the tubing segments. However, this extra machining will, again, significantly increase the manufacturing costs and the aesthetic unattractiveness of the framing.

Consequently, there is a need for columns and truss structures for use in displays that are aesthetically appealing, and cost efficient. This structure should be substantially free of intermediate webbing and other distractive and space limiting members. In addition, this box frame structure should be lightweight and of sound structural stability, and capable of selectively securing removable grasping attachments along substantially the entire length of the tubing segments for providing optimal flexibility for incorporating shelves, work tables, video screens, graphic screens and the like. Lastly, the structure must incorporate all of this while at the same time maintaining the ease of construction and configurability required of portable display designs.

SUMMARY OF THE INVENTION

The present invention substantially meets the needs of the industry for a lightweight, structurally rigid, flexibly configurable, display structure. The invention generally includes an elongated columnar structure for use in constructing displays having at least one elongate substantially open parallelepiped structure having a pair of opposing ends. The parallelepiped

structure includes a plurality of spaced apart elongate members operably coupled by a pair of spaced apart opposing end webbing members. Each elongate member defines an outside corner of the parallelepiped structure. The column further includes at least one extension module selectively couplable with one of the ends of the parallelepiped structure. The extension module includes a hollow, sheet metal enclosure having at least a top, a bottom, and four sides, the four sides intersecting at four outside corners. Each of the four outside corners of the extension module align with a separate one of the outside corners of the parallelepiped structure when the extension module is coupled with the parallelepiped structure.

A parallelepiped structure according to the invention generally includes a plurality of frame segments with webbing attached to each end of the plurality of frame segments and no webbing intermediate the tubing ends. The plurality of frame segments are attached to the end piece such that a column-like structure is formed. The inner space defined within the frame segments is substantially free of webbing. Instead, structural strength and stability is achieved by the end webbing. The end of one elongated box frame structure is capable of removably connecting with the end piece of other similar elongated box frame structures to achieve varying framing heights and other dynamic configurations.

The absence of webbing and other bracing intermediate the ends is a significant feature and advantage that in itself generates other features and advantages.

A significant feature and advantage of utilizing an elongated box frame assembly free of webbing is that it is aesthetically appealing. Visual appeal is essential in trade show displays and other exhibition environments.

Another significant feature and advantage of eliminating webbing in the present invention is that manufacturing and material costs are significantly reduced since fewer

components are required. Reduced components provide a benefit to the end user as well by simplifying assembly and disassembly.

A further feature and advantage of the column structure according to the present invention centers around frame attachments, such as shelving. The absence of space limiting webbing means that there are significantly more attachment and grasping points along the entire length of each frame segment. As a result, a valuable proliferation in configuration options is made available to the end user.

Further features and advantages of the present invention relate to the extension module. The extension module of the present invention may be connected with other extension modules, parallelepiped box frames, trusses, or any other modular display component to form a multiplicity of unique, selectively configurable, display configurations. Center and corner apertures significantly lighten the extension module without compromising structural integrity of the column. All three adjacent sides of the extension module meet and engage at each corner for optimal structural strength and rigidity. Thus, the extension module combined with the open, bracing free, parallelepiped structure of the box frame of the present invention, which also is advantageously light and structurally rigid, offers a flexibly configurable, lightweight, structurally rigid, and aesthetically pleasing column assembly for a display structure.

The following U.S. Patent Applications, commonly owned by the owner of the present invention, are hereby fully incorporated herein by reference: U.S. Patent Application No. 09/953,098, entitled "DISPLAY WITH APPURTENANCE ATTACHMENT"; U.S. Patent Application No. 09/953,099, entitled "SCREEN MOUNTING APPARATUS"; U.S. Patent Application No. 09/953,113, entitled "MODULAR MULTI-CONFIGURABLE DISPLAY SYSTEM".

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded view of the box frame column and box frame truss in accordance with the invention;

Fig. 2 is a perspective view of a box frame column member in accordance with the invention;

Fig. 3 is a front perspective view of a framework for a display back wall in accordance with the invention;

Fig. 4 is a perspective view of a display back wall including graphic display screens;

Fig. 5a is a plan view of a stamping for forming an end webbing;

Fig. 5b is a perspective view of the piece of Figure 5a suitably bent for an end webbing in accordance with the invention;

Fig. 6 is a perspective view of a portion of a vertical column member in accordance with the invention herein with a table adjustably mounted hereto;

Fig. 7 is a perspective view of the lower portion of a box frame member attached to a truss member with an attached graphic screen in accordance with the invention herein;

Fig. 8 is a perspective view of a box frame column member and attached appurtenances in accordance with the invention herein;

Fig. 9 is a perspective view of an extension module according to the present invention;

Fig. 10 is an enlarged view of a corner of the extension module of Fig. 9;

Fig. 11 is a side elevation view of one body component of the extension module depicted in Fig. 9;

Fig. 11a is a plan view of a plate for forming a body component of the extension module;

Fig. 11b is an exploded view of an embodiment of the extension module;

Fig. 12 is a front elevation view of the body component depicted in Fig. 11;

Fig. 13 is a bottom plan view of the body component depicted in Fig. 11; and

Fig. 14 is a perspective view of an extension module according to the present invention assembled with a pair of box frame members to form a column structure.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to Figs. 1, 2, 3 and 4, embodiments of the present invention are depicted. Specifically referring to Fig. 2, an elongated box frame 20 is depicted and generally includes four frame segments 22 all of equal dimensions, and a pair of end webbings 26. Each frame segment 22 has a first end 27 and a second end 28. The frame segments 22 each define an outside corner 29 of box frame 20. The frame segments 22, in this embodiment, extend to a first end 30 and second end 31 of box frame 20. Each end 30, 31, of the elongated box frame has connecting portions 32 configured as sockets that are open for receiving male connector portions or connector pieces 38 as depicted in Fig. 1. Threaded portions 40 configured as nuts may be welded onto the ends 44 of the individual frame segments 22.

The connector pieces 38 generally include a central body section 50 and narrowed connecting segments 52. Connecting segments 52 have dimples 54 for assisting positioning of set screws 56. Threaded bores 60 may be utilized to connect threaded feet 64 or other appurtenances.

Referring to Fig. 1, the connectors 38 also engage the horizontal truss member 70. Truss member 70 similarly has open sockets 72 at the ends of the square tubing for receiving the connector 38. End webbing 76 may be U-shaped in an embodiment which provides complete

access to three sides 78 of the truss frame segments 80. The fourth side 82 has access on both sides of the connection point 86 of the U-shaped member to the truss frame segment 80.

Referring to Figs. 1, 5a, and 5b, details of the end webbing 26 are illustrated. The end webbing 26 is positioned at the ends 30, 31, of the box frame and is appropriately permanently attached to the box frame segments such as by welding. Fig. 5a illustrates a suitable stamping for formation of the end webbing. The dashed lines 90 illustrate the bend lines 92 which join the sides 94 of the webbing to the top surface 96 of the horizontal plate portion 97. The webbing piece has four inset corners 98 for each frame segment and a vertical portion 99, extending parallel to the frame segments, which when welded to the frame segments, significantly enhances the strength of the box frame. A central aperture 102 and cutouts 103 lighten the structure without significantly reducing the strength of the webbing and further provide an aesthetically pleasing appearance.

Box frame 20 presents an axis a , about which the frame segments 22 and aperture 102 are centered. Although the end “webbing” 26 as illustrated is formed of a single unitary piece, it is also contemplated that the webbing could be formed of individual strips bridging adjacent frame segments. Thus “webbing” is defined as the structure securing segments together, whether a single unitary piece or multiple pieces. Similarly, “bracing” is defined as any structure extending between the frame segments 22.

Referring to Figs. 6, 7 and 8, various appurtenances that may be attached to the elongated box frames are illustrated. It is very desirable to be able to attach these appurtenances and others at any desired location intermediate the ends of the box frames. As illustrated in Fig. 6, a table utilizing a clamp for attaching said table 104 to a pair 105 of frame segments along any desired position as indicated by the arrow 106. Significantly, the elongated box frames have an

intermediate portion 89 positioned intermediate the box frame ends. Intermediate portion 89 does not have any webbing or bracing. This facilitates four “clean” frame segments for variable positioning of appurtenances, as illustrated in Figs. 6 and 8, and for providing an aesthetically pleasing and uncluttered look. In a most preferred embodiment, the clean intermediate portion without webbing will constitute 70 percent or more of the length of the box frame 20.

Fig. 7 illustrates a screen 110, attached with individual tabs at the ends 108 or sides of the screen 110. Such an appurtenance and the attachment means thereof are explained in detail in the related Applications incorporated by reference hereinabove. Fig. 8 depicts brackets for holding appurtenances such as shelves which are attached by way of circumferential hooked bracket attachment sleeves 110. Sleeves 110 can wrap around the entire length of the box frame 20 to provide an aesthetically pleasing and simple slotted structure for attaching said appurtenance brackets wherever desired, or they can be positioned on specific portions of the frame segments 22.

An extension module 140 is depicted in Figs. 9-14. Extension module 140 may be selectively coupled with one or more box frames 20, trusses 70, or other extension modules 140 to form columns of any desired length and configuration for a multiplicity of display configurations. Extension module 140 is generally a hollow cubic enclosure 142, preferably made from sheet metal, including a top 144, a bottom 146, and four sides 148.

Although hollow enclosure 142 may be formed by any suitable means or methods, in a preferred embodiment, hollow enclosure 142 generally includes a first u-shaped body portion 152 and a second u-shaped body portion 154. Each u-shaped body portion 152, 154, generally includes a center portion 156 and a pair of generally perpendicular opposing side portions 158, 160. Body portions 152, 154, are interfitted together as depicted in Fig. 9a, with center portions

156 opposing and with side portions 158, 160, adjacent and perpendicular so as to define a hollow cube when fully engaged as depicted in Fig. 9.

U-shaped body portions 152, 154, may each be formed from a single flat metal plate 162, which may be bent along bend lines 164 so as to define the u-shape of the body portion 152, 154. Center portion 156 and each side portion 158, 160, may have one or more center apertures 162 defined therein. Corner apertures 166 may be defined within each u-shaped body portion 152, 154, by positioning apertures 168 along bend lines 164. Other corner apertures 168 may be defined between interfitted body portions 152, 154, by providing cutouts 170 in the periphery 172 of plate 162. Center apertures 162 and corner apertures 166, 168, serve to lighten extension module 140 and lend an aesthetically pleasing open appearance. Projecting tabs 174 may be provided at the corners 176 of plate 162, and corresponding receiving notches 178 may be formed in periphery 172 along bend lines 164. When body portions 152, 154, are interfitted, tabs 174 are securely received in notches 178 as depicted best in Fig. 10, so as to form smooth, structural corners. Body portions 152, 154, may be welded together or otherwise fastened together by any suitable means.

It is most preferred that extension module 140 be of a cubic shape, and sized so that corners 179 of extension module 140 align with outside corners 29 of box frame 20 when extension module 140 is coupled with one or more box frames 20 to form a column structure 180 as depicted in Fig. 14. Cutouts 103 of end webbing 26 in each box frame 20 mate with and mirror the shape of corner apertures 166, 168, to lend an aesthetically pleasing appearance to the overall column structure 180. Extension module 140 may be connected with the box frames 20 using removable fasteners (not depicted) through fastener holes 182, or by any other suitable means.

The center apertures 162 and corner apertures 166, 168, significantly lighten extension module 140 without compromising structural integrity. All three adjacent sides of extension module 140 meet and engage at each corner 179 for optimal structural strength and rigidity. Extension module 140, combined with the open, bracing free, parallelepiped structure of box frame 20, which also is advantageously light and structurally rigid, offers a flexibly configurable, lightweight, structurally rigid, and aesthetically pleasing column assembly for a display structure. One or more sides of extension module 140 may be open, but this configuration is less preferred.

Although depicted herein as a symmetrical cubic form, it will be appreciated that extension module 140 may be made in any other desired geometric shape. For example, sides 148 may be elongated so that extension module 140 has an elongated rectangular cuboid shape. In addition, top 144 and bottom 146, may be hexagonal, octagonal, or any other geometric shape to accommodate box frames 20 having a corresponding geometrical shape.

Although extension module 140 is depicted in Fig. 14 connecting two box frames 20, it will be appreciated that a multiplicity of display configurations are possible with extension module 140, and such configurations are contemplated within the scope of the present invention. For example, an extension module 140 may be positioned at the base of a column in contact with the ground, at the top of the column, or both at the bottom and top of a column. Multiple extension modules 140 may be positioned adjacent between box frames 20, or may be alternated with box frames 20 to form a column of any desired length. In addition, truss members 70 may be connected with extension module 140 using removable fasteners (not depicted) in fastener holes 182 or any other suitable means to form display frames for displaying graphic material.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be

considered in all respects as illustrative and not restrictive, reference being made to the appended claims rather than to the foregoing description to indicate the scope of the invention.